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**Patent and Trademark Office**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/073,494	05/06/98	PAN	2915.105 (96-

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MMC1/0314

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2811

EXAMINER

ART UNIT

PAPER NUMBER

03/14/00  
DATE MAILED:

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/073,494

Applicant(s)

PAN ET AL.

Examiner

HUNG K. VU

Group Art Unit

2811



☒ Responsive to communication(s) filed on Dec 21, 1999

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 23-28 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 23-28 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 24 and 28 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification does not disclose a metallic silicide film is crystalline, as recited in claims 24 and 28.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 23-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Tung (PN 5,728,625, of record).

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Tung discloses a gate stack on a dielectric layered semiconductor substrate (302) comprising, a polysilicon layer (304) disposed over the dielectric layered semiconductor substrate; a non-crystalline silicide film (305) disposed over the polysilicon layer; a dielectric cap (307) on the non-crystalline metallic film; wherein the metallic silicide is substantially devoid of silicon clusters; wherein the dielectric layer is substantially devoid of pitting. Note Figures 3A-4D of Tung.

***Response to Arguments***

3. Applicant's arguments filed 12/21/99 have been fully considered but they are not persuasive.

The rejection based on the Segawa et al. reference has been withdrawn.

It is argued, at page 6 of the Remarks, that Tung fails to disclose either expressly or inherently a non-crystalline metallic silicide layer. This argument is not convincing. In column 6, lines 11-19, Tung discloses that after the cobalt layer 220 is formed on the substrate, the substrate is then annealed to convert the cobalt to cobalt silicide layer at the temperature about 450°C. In fact, Tung discloses that the temperature at which the substrate is annealed is largely a matter of design choice. Further, in column 7, lines 1-12, and in column 8, lines 3-16, Tung discloses that after

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forming the tungsten silicide, an n-type dopant such as As is then implanted into the tungsten silicide. So that even if tungsten silicide is being formed at high temperature, the As dopant would then amorphize the silicide film. This would lead to the silicide film with substantially devoid of the silicon clusters. Therefore, it is inherently that the tungsten silicide is non-crystalline.

It is argued, at page 7 of the Remarks, that Tung does not disclose the dielectric layer is substantially devoid of pitting. This argument is not convincing. For the same reason as above, because the silicide film is substantially devoid of silicon clusters, it is inherently that the dielectric layer is substantially devoid of pitting.

### ***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Papers related to this application may be submitted to Technology Center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to **Hung K. Vu** whose telephone number is **(703) 308-4079**. The Examiner is in the Office generally between the hours of 7:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **308-0956**.

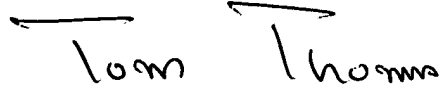
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Vu

March 11, 2000

  
Tom Thomas  
Supervisory Patent Examiner  
Technology Center 2000